

## Surveys of the vertebrate fauna in native grasslands of the Riverine Plain, New South Wales

David G Parker

NSW Department of Environment and Climate Change, PO Box 397, Griffith, NSW 2680

Email: david.parker@environment.nsw.gov.au

### Abstract

Surveys of native grasslands for the Plains-wanderer *Pedionomus torquatus* were conducted at 12 survey sites on eight properties over five years on the Riverine Plain of southern New South Wales between November 2001 and December 2006. The main focus of these surveys was to undertake population monitoring of the threatened Plains-wanderer; however, all other vertebrate species detected, excluding macropods, also were recorded. A total of 4863 faunal observations were made, encompassing 35 native species: 24 species of bird, six reptiles, three amphibians and six mammals, of which four were introduced. Plains-wanderers were recorded at 11 of the 12 survey sites. (*The Victorian Naturalist* 126 (4) 2009, 128-134)

**Keywords:** native grasslands, fauna, Riverine Plain, Plains-wanderer, conservation

### Introduction

The Riverine Plain of New South Wales contains a diverse range of habitats, including riverine forests, box eucalypt and cypress pine woodlands, acacia and chenopod shrublands and native grasslands (Eardley 1999). Of these, the native grasslands are among the most threatened and poorly conserved ecosystems in south-eastern Australia (McDougall and Kirkpatrick 1994; Baker-Gabb 1998; Eardley 1999). Grasslands may appear to be simple-structured communities (Lunt 1991) but their floristic diversity, faunal composition and the interactions between the two illustrate their complexity (Baker-Gabb 1998; Lunt *et al.* 1998; Hadden 2002).

Since European settlement, native grasslands have been greatly altered in extent by agriculture and livestock production (Benson 1991; Lunt 1991; McDougall and Kirkpatrick 1994). Native grasslands contain a disproportionately large number of threatened plant and fauna species such as the Plains-wanderer *Pedionomus torquatus* (Baker-Gabb 1998). A significant decline in grassland species, such as the Brown Songlark *Cinchoramphus cruralis*, Australasian (Richard's) Pipit *Anthus novaeseelandiae*, Horsfield's (Singing) Bushlark *Mirafra javanica* and Banded Lapwing *Vanellus tricolor*, has been observed in recent years (Barrett *et al.* 2003).

Effective long-term conservation of these grasslands requires clear objectives, strategic planning, and active management by a range

of land managers, to ensure that the status of wildlife populations and their habitats are maintained and improved (Baker-Gabb 1998; Bennett *et al.* 1998). The principal aim of the study presented in this paper was to monitor changes in the population of the endangered Plains-wanderer in native grasslands of the Riverine Plain, NSW, but the sampling technique also allowed detailed counts of other grassland fauna to be conducted. Thus, this paper also documents the vertebrate species, except macropods, recorded in these native grasslands.

### Methods

#### Study sites

Twelve monitoring grids were established in native grasslands on the Riverine Plain of NSW between Conargo (35°18'09" S, 145°10'43" E) and Jerilderie (35°21'36" S, 145°43'37" E) in the south and between Hay (34°30'51" S, 144°50'44" E) and Carrathool (34°36'25" S, 145°25'33" E) (south of the Sturt Highway) in the north. Four grids were established on Oolambeyan National Park, one on a travelling stock route and seven on private property. Selection of sites for placement of grids was determined using historical information on Plains-wanderers contained in Maher (1997), vegetation mapping by Roberts and Roberts (2001), personal observation and landowner consent. These sites were located in grasslands with different floristic composition, physical structure and grazing management regimes.

### Survey method

Although there was some variation in shape and size, a typical grid measured 50 ha in size and was 1000 m long and 500 m wide. The grids were formed by placing 1.5 m flexible poles every 200 m along parallel transects that were 50 m apart. The flexible poles were spring-loaded to prevent them being damaged by stock or used as perches by raptors. Each pole was fitted with a band of reflective tape that was detectable at night by spotlight from 200 m away. Nocturnal fauna surveys were conducted by driving a vehicle at <5 kph along the transects and spotlighting to a distance of 15-20 m, depending on the height and density of the grass. Field surveys were conducted twice yearly from the vehicle from November 2001 to December 2006, typically during June (Winter) (i.e. Round 1) and November (late Spring) (i.e. Round 2). Each grid was surveyed twice during each round. This was on consecutive nights; however, weather conditions (rain, strong winds, dust storms etc.) and/or accessibility meant some sites were not surveyed during a round.

Although the main purpose of the survey was to detect and monitor the number of Plains-wanderers at each site, the presence and abundance of other vertebrate species inhabiting the grasslands also were recorded. Only those species observed on the grid were recorded, though opportunistic (off-grid) observations also were noted. Occasional hand-capturing of individuals was required to aid identification.

### Results

A total of 35 native species (three amphibians, six reptiles, 24 birds and two mammals - excluding macropod) including one threatened species, the Plains-wanderer, and four introduced species (all mammals), were recorded during eleven rounds of monitoring between November 2001 and December 2006. In total, 4865 individuals were recorded from 245 spotlighting sessions over a total of 631 hours and covering 3675 km (Table 1). Most observations (83%; 3968) were of birds, particularly Australasian Pipit (35% of all animals observed). Five species accounted for 83% of observations: Australasian Pipit, Fat-tailed Dunnart *Sminthopsis crassicaudata*, Stubble Quail *Coturnix pectoralis*, Banded Lapwing and Brown Songlark.

### Amphibians

Frogs were not detected in any great numbers, with only three species encountered. Frogs were detected at six of the 12 sites, with two or three individuals of each species being recorded in total (Table 2). Small swampy areas or depressions occurred on or near to (<200m) five of the twelve grids. These were dry on the surface during most of the survey period and held water only after significant rains during two survey rounds (Spring/Summer 2004 and Winter 2005).

### Reptiles

Six species of reptile were recorded from 10 of the 12 survey sites, with a total of 65 individuals observed (Table 3). Three species were recorded during spotlight events: the Curl Snake *Suta suta* was recorded at eight sites, the Eastern Hooded Scaly-foot *Pygopus schraderi* at six sites and the Tessellated Gecko *Diplodactylus tessellatus* at three sites. Three other reptiles also were recorded: the Shingleback Lizard *Trachydosaurus rugosus* and Eastern Bearded Dragon *Pogona barbata* were both observed from two sites each, roosting at the base of thick grass tussocks, while an Eastern Brown Snake *Pseudonaja textilis* was observed from one site and was in the process of entering a burrow.

One additional reptile species, the Red-naped Snake *Furina diadema*, was observed opportunistically at one site during vegetation sampling in the daytime.

### Birds

A total of 24 species of bird, all of which were native, were recorded during the survey period (Table 4). Of the bird species recorded, six (Stubble Quail, Little Button-quail *Turnix velox*, Plains-wanderer, Banded Lapwing, Australasian Pipit and Brown Songlark) constituted approximately 95% of all individuals observed. The Australasian Pipit was the most abundant species encountered (42.5%), recorded from all study sites, and at one or more sites during all survey rounds. Similarly, the Stubble Quail and Banded Lapwing were recorded from all 12 study sites. The endangered Plains-wanderer was detected at eleven of the twelve study sites and was observed within sparse native grasslands during ten of the 11 survey rounds. All other species made up less than 1% each of the total birds observed.

Table 1. Survey effort across the study sites.

Site No.	Average length of grid (km)	No. survey nights	Total distance (km)	Total time (hrs:mins)	Total No. of individuals
1	7.1	20	142.4	23:05	130
2	11.6	20	232.1	43:10	230
3	16.8	20	337.0	57:39	294
4	12.1	22	267.9	48:20	317
5	18.4	21	387.1	63:06	262
6	18.3	22	402.3	69:17	464
7	16.8	22	369.6	65:05	1067
8	16.3	22	358.8	63:09	671
9	15.3	22	336.0	58:43	515
10	18.5	22	408.4	68:28	302
11	14.2	16	226.8	38:36	350
12	12.9	16	206.8	32:35	261

Table 2. Amphibian species recorded from native grasslands of the Riverine Plain.

Common Name	Scientific Name	Total count	Total sites where species recorded
Giant Banjo Frog	<i>Limnodynastes interioris</i>	2	2
Spotted Marsh Frog	<i>Limnodynastes tasmaniensis</i>	2	2
Common Spadefoot Toad	<i>Neobatrachus sudelli</i>	3	2
Unidentified frog		2	1

Table 3. Reptile species recorded from native grasslands of the Riverine Plain. # = incidental record.

Common Name	Scientific Name	Total count	Total sites where species recorded
Tessellated Gecko	<i>Diplodactylus tessellatus</i>	5	3
Eastern Hooded Scaly-foot	<i>Pygopus schraderi</i>	27	6
Eastern Bearded Dragon	<i>Pogona barbata</i>	2	2
Shingleback Lizard	<i>Trachydosaurus rugosus</i>	2	2
Red-naped Snake <sup>#</sup>	<i>Furina diadema</i>	1	1
Eastern Brown Snake	<i>Pseudonaja textilis</i>	1	1
Curl Snake	<i>Suta suta</i>	27	8

Three species of nocturnal bird of prey were recorded. The Eastern Barn Owl *Tyto javanica* was the most common, and was observed at ten of the 12 study sites. Birds were typically observed flying over the site; however, individuals were seen to land on the ground within the site on several occasions. The Southern Boobook *Ninox novaeseelandiae* and Tawny Frogmouth *Podargus strigoides* also were recorded only on one occasion each. The former was observed flying over the site, while the latter was observed perched on fallen dead timber.

Individual or small clumps of Boree *Acacia pendula* in some grids provided roost and/or nesting sites for five diurnal bird species: Black-shouldered Kite *Elanus axillaris* (roosting and nesting), Nankeen Kestrel *Falco cenchroides* (roosting and nesting), Crested Pigeon *Ocyphaps lophotes* (roosting), Willie Wagtail *Rhipidura leucophrys* (roosting) and Australian Magpie *Cracticus tibicen* (roosting). The grassland habitat also provided ground roosting sites for the Spotted Harrier *Circus assimilis*, Wedge-tailed Eagle *Aquila audax*, Nankeen Kestrel,

**Table 4.** Birds species recorded from native grasslands of the Riverine Plain. + = present but exact numbers not recorded; # = incidental record.

Common Name	Scientific Name	Total count	Total sites where species recorded
Emu	<i>Dromaius novaehollandiae</i>	2	2
Stubble Quail	<i>Coturnix pectoralis</i>	783	12
Pacific Black Duck	<i>Anas superciliosa</i>	4	1
Black-shouldered Kite	<i>Elanus axillaris</i>	1	1
Spotted Harrier	<i>Circus assimilis</i>	1	1
Wedge-tailed Eagle	<i>Aquila audax</i>	1	1
Black Falcon*	<i>Falco subniger</i>	+	3
Nankeen Kestrel	<i>Falco cenchroides</i>	15	3
Little Button-quail	<i>Turnix velox</i>	280	11
Red-chested Button-quail	<i>Turnix pyrrhоторax</i>	4	1
Plains-wanderer	<i>Pedionomus torquatus</i>	172	11
Inland Dotterel	<i>Charadrius australis</i>	31	3
Banded Lapwing	<i>Vanellus tricolor</i>	543	12
Australian Pratincole	<i>Stiltia isabella</i>	29	3
Crested Pigeon	<i>Ocyphaps lophotes</i>	2	1
Southern Boobook	<i>Ninox novaeseelandiae</i>	1	1
Eastern Barn Owl	<i>Tyto alba</i>	28	11
Tawny Frogmouth	<i>Podargus strigoides</i>	1	1
Southern Whiteface	<i>Aphelocephala leucopsis</i>	1	1
Orange Chat*	<i>Epthianura aurifrons</i>	+	1
Willie Wagtail	<i>Rhipidura leucophrys</i>	1	1
Australian Magpie	<i>Cracticus tibicen</i>	32	3
Horsfield's Bushlark	<i>Mirafra javanica</i>	33	6
Australasian Pipit	<i>Anthus novaeseelandiae</i>	1688	12
Rufous Songlark	<i>Cincloramphus mathewsi</i>	2	2
Brown Songlark	<i>Cincloramphus cruralis</i>	313	12

Southern Whiteface *Aphelocephala leucopsis* and Australian Magpie. The Pacific Black Duck *Anas superciliosa* was recorded once on a section of flooded farm track.

Two additional bird species were observed opportunistically while undertaking vegetation sampling during the day. These species were: Black Falcon *Falco subniger* (three sites) and Orange Chat *Epthianura aurifrons* (one site).

### Mammals

Two native mammal species (excluding macropods) were identified from the 12 study sites (Table 5). The Fat-tailed Dunnart was recorded at all 12 study sites, while the Common Dunnart *Sminthopsis murina* was recorded at three sites.

Four introduced species were recorded: the Red Fox *Vulpes vulpes*, Feral Cat *Felis catus*, House Mouse *Mus musculus*, and European Rabbit *Oryctolagus cuniculus*. The Red Fox was recorded at 10 of the 12 study sites, while the Feral Cat was encountered at only one site.

### Discussion

All species recorded during this study conformed to previously known distributions. The Plains-wanderer, the target species of this study, is of state and national conservation significance (Baker-Gabb 1998; Bennett *et al.* 1998). Several other grassland species recorded during this study also are considered to be in decline in the Riverina Bioregion, which includes NSW and Victoria, and include the Brown Songlark, Australasian Pipit, Horsfield's Bushlark, and Banded Lapwing (Barrett *et al.* 2003). Five species recorded during this study are listed within Victorian State Threatened Species legislation: two critically endangered (Hooded Scaly-foot and Giant Banjo Frog *Limnodynastes interioris*); one endangered (Plains-wanderer); and two vulnerable (Red-chested Button-quail *Turnix pyrrhоторax* and Curl Snake).

The survey technique limited the detection of most reptile and amphibian species; however, the survey methods adopted were appropriate for detecting two species, the Hooded Scaly-

**Table 5.** Mammal species, excluding macropods, recorded from native grasslands of the Riverine Plain. \* = introduced species; + = present but exact numbers not recorded.

Common Name	Scientific Name	Total count	Total sites where species recorded
Common Dunnart	<i>Sminthopsis murina</i>	8	3
Fat-tailed Dunnart	<i>Sminthopsis crassicaudata</i>	708	12
House Mouse*	<i>Mus musculus</i>	72	10
Red Fox*	<i>Vulpes vulpes</i>	34	10
Feral Cat*	<i>Felius catus</i>	1	1
European Rabbit*	<i>Oryctolagus cuniculus</i>	+	1

foot and the Curl Snake. These species are terrestrial and nocturnal and utilise a range of habitats including grasslands (Cogger 1992; Swan *et al.* 2004). Both of these species are often associated with fallen timber, and surface rocks, but also ant and termite nests and deep earth cracks (Swan *et al.* 2004). All of these refuges, except surface rocks, were present at those sites where these species were recorded. The Tessellated Gecko, though considered cryptic (Brown and Bennett 1995), was recorded during this study. This species is widely distributed throughout dry regions of central and eastern Australia (Cogger 1992). The study area represents the eastern limit of its range (Swan *et al.* 2004; Atlas of NSW Wildlife 2007). The Giant Banjo Frog and the Common Spadefoot Toad *Neobatrachus sudelli* are burrowing fossorial species that spend much of their life concealed underground, emerging only after substantial rains (Hero *et al.* 1991; Bennett *et al.* 1998). It was only after such events that all three species of frog were encountered during this study. It is very likely that many more reptile and amphibian species would have been recorded if a greater range of survey methods had been applied.

Birds were the most diverse group of vertebrate fauna recorded in native grasslands. The results of this study concur with those of others examining bird communities in Riverina grasslands in NSW (Baker-Gabb *et al.* 1990; Maher 1997) and in northern Victoria (Maher and Baker-Gabb 1993). While the commonly recorded Australasian Pipit is sedentary or locally nomadic, both the Stubble Quail and Banded Lapwing are considered nomadic, with movements influenced by rainfall (Marchant and Higgins 1993). In a descriptive account of grassland birds from two Riverina properties, Baker-Gabb *et al.* (1990: 164) stated that:

'Plains-wanderers and Richard's Pipit were always present. Banded Lapwings were absent for up to three months, while the Stubble Quail, Brown Songlark and Singing [Horsfield's] Bushlark were absent for up to five months, and Little Button-quail were away for much longer periods.' Baker-Gabb *et al.* (1990) encountered 401 Horsfield's Bushlarks over a total driven distance of 2121 km (665 hrs), while this study encountered only 33 individuals over a total driven distance of 3675 km (631 hrs). Barrett *et al.* (2003) noted a 20% decline in the reporting rate of the Horsfield's Bushlark in the New Atlas of Australian Birds (1998-2002) compared to the Atlas of Australian Birds (1977-81), with the Riverina Bioregion being one of the areas in which this decline was evident.

The Inland Dotterel and Australian Pratincole are spring/summer visitors to native grasslands on the Riverine Plain. Their movements often correlated with annual summer rainfall, escape from dry periods elsewhere, or migration (Higgins and Davies 1996). During the survey period, these two species were irregular visitors and were present only when habitat conditions were suitable. The Red-chested Button-quail was recorded on only one occasion—an adult with three chicks—during spring 2003. Native grasslands appear to be the preferred habitat of the species (Bennett *et al.* 1998); however, it has been recorded from other vegetation types such as grassy woodlands (Marchant and Higgins 1993). This species is regarded as being generally uncommon across Australia, but apparently secure (Marchant and Higgins 1993). Maher (1997) recorded the Red-chested Button-quail only twice in native grasslands on the Riverine Plain during surveys between 1995 and 1997.

The Fat-tailed Dunnart was the most common native mammal recorded during the study and occurs mostly in open vegetation on a

variety of soil and vegetation types, including open woodlands, low chenopod shrublands, tussock grasslands and gibber plains (Dickman and Read 1992; Morton 1995). It is regarded as the most widespread and abundant dasyurid in western NSW (Dickman and Read 1992). Recent faunal studies in native grasslands of the Northern 'Riverine' Plains of Victoria (Hadden 2002; Michael *et al.* 2003) also found this species to be common in sites that were lightly grazed and contained open vegetation cover. The Common Dunnart was irregularly recorded during this study and is considered to be sparsely distributed across south-eastern Australia, mostly inhabiting woodland, forest and scrub (Dickman and Read 1992; Fox 1995). In a study of the mammalian fauna of remnant native grasslands in Victoria, Hadden (2002) recorded the Common Dunnart only once, from native grasslands on the Western Basalt Plains. The presence of Common Dunnart during this survey supports Hadden's (2002) suggestion that the species may occupy grassland habitats, particularly in close proximity to woodland vegetation.

Despite the limited sampling techniques applied during this study, the results highlight the importance of the native grasslands on the NSW Riverina Plains for a range of fauna. While recent acquisitions by the NSW State Government have increased significantly the amount of native grassland contained within the reserve system in the Riverina Bioregion, most native grasslands occur on privately owned land. Bennett *et al.* (1998: 74) state, 'the future of the wildlife of the [Victorian] Riverina is not solely the responsibility of government or any single agency: it depends ultimately on the concern and actions of the whole community'. The retention and maintenance of native grassland habitat across all tenures is critical for the conservation of species such as the Plains-wanderer, as well as other grassland flora and fauna. There are new opportunities for incentive-based management agreements on private land for biodiversity conservation.

#### Acknowledgements

The author would like to thank David Baker-Gabb and the Plains-wanderer Recovery Team, who assisted in the development of this monitoring program from which these results were derived. This study was funded by the NSW Department of Environment and Conservation, including the Fox Threat Abatement Program. Fieldwork was carried out under the relevant permits and licences provided by the NSW

National Parks and Wildlife Service. Sincere thanks go to the landholders and managers who kindly allowed access to their properties. Damon Oliver, Matt Cameron, Ross McDonnell, Colin Killick, Michelle Ballestrin and Mick Domaille provided logistical and on-ground support as well as accommodation at Oolambeyan National Park. Thanks also to the numerous volunteers who shared the sunsets, the night skies, and freezing cold nights. David Baker-Gabb, Damon Oliver and Rick Webster kindly commented on the manuscript.

#### References

- Atlas of New South Wales Wildlife database (2007). Department of Environment and Climate Change, Hurstville.
- Baker-Gabb DJ, Benshemesh J and Maher, PN (1990) A revision of the distribution, status and management of the Plains-wanderer *Pedionomus torquatus*. *Emu* 90, 161-168.
- Baker-Gabb DJ (1998) Native grasslands and the Plains-wanderer. Supplement to *Wingspan* 8, Royal Australasian Ornithologists Union (Birds Australia) Conservation Statement No.1. Royal Australasian Ornithologists Union (Birds Australia), East Melbourne, Vic.
- Barrett G, Silcocks A, Barry S, Cunningham R and Poulter R (2003) *The New Atlas of Australian Birds*. (Royal Australasian Ornithologists Union (Birds Australia): East Melbourne)
- Bennett AF, Brown J, Lumsden LE, Hesp D, Krasna S and Silins J (1998) *Fragments for the Future: Wildlife in the Victorian Riverina (the Northern Plains)*. (Department of Natural Resources and Environment: East Melbourne)
- Benson J (1991) The effect of 200 years of European settlement on the vegetation and flora of New South Wales. *Cunninghamia* 2, 343-370.
- Brown G and Bennett A (1995) Reptiles in Rural Environments: The Distribution, Habitat Requirements and Conservation Status of the Reptile Fauna of the Murray-Darling Basin Area in Victoria. A report to the Murray-Darling Basin Commission. Department of Conservation and Natural Resources, Heidelberg.
- Cogger HG (1992) *Reptiles and Amphibians of Australia*. 6th ed. (Reed New Holland: Sydney)
- Dickman CR and Read DG (1992) The biology and management of dasyurids of the arid zone in NSW. NSW National Parks and Wildlife Service Species Management Report No.11. NSW National Parks and Wildlife Service, Hurstville, NSW.
- Eardley KA (1999) A foundation for conservation in the Riverina Bioregion. Unpublished report, NSW National Parks and Wildlife Service, Hurstville, NSW.
- Fox BJ (1995) Common Dunnart *Sminthopsis murina*. In *The Mammals of Australia*. Rev ed, pp. 150-151. Ed R Strahan. (Australian Museum and Reed Books: NSW)
- Hadden SA (2002) The mammal fauna of remnant native grasslands of the Western Basalt Plains and Northern Plains of Victoria. *The Victorian Naturalist* 119, 14-20.
- Hero J-M, Littlejohn M and Marantelli G (1991) *Frogwatch Field Guide to Victorian Frogs*. (Department of Conservation and Environment: East Melbourne)
- Higgins PJ and Davies SJJF (eds) (1996) *Handbook of Australian, New Zealand and Antarctic Birds*. Vol 3, *Snipe to Pigeons*. (Oxford University Press: Melbourne)
- Lunt ID (1991) Management of remnant lowland native grassland and grassy woodland for nature conservation: a review. *The Victorian Naturalist* 98, 56-66.
- Lunt ID, Barlow T and Ross J (1998) Plains Wandering: exploring the grassy plants of south-eastern Australia. (Victorian National Parks Association Inc. and Trust For Nature: Victoria)
- McDougall K and Kirkpatrick JB (eds) (1994) *Conservation of Lowland Native Grassland in South-eastern Australia*.

(World Wide Fund for Nature Australia: Australia)  
Maher PN and Baker-Gabb DJ (1993) *Surveys and conservation of the Plains-wanderer in northern Victoria*. ARI Technical Report No. 132. DCNR, Melbourne.  
Maher PN (1997) A survey of Plains-wanderers (*Pedionomus torquatus*) and native grasslands on the Riverine Plains, New South Wales. Unpublished report, Birds Australia, Melbourne.  
Marchant S and Higgins PJ (eds) (1993) *Handbook of Australian, New Zealand and Antarctic Birds*. Vol 2, *Raptors to Lapwings*. (Oxford University Press: Melbourne)  
Michael DR, Lunt ID, and Robinson WA (2003) Terrestrial vertebrate fauna of grasslands and grassy woodland in Terrick Terrick National Park, Northern Victoria. *The Victorian Naturalist* 120, 164-171.  
Morcombe M (2000) *Field Guide to Australian Birds*. (Steve Parish Publishing: Archerfield, Qld)  
Morton SR (1995) Fat-tailed Dunnart *Sminthopsis crassicaudata*. In *The Mammals of Australia*. Rev ed, pp. 129-131. Ed R Strahan. (Australian Museum and Reed Books: NSW)

NSW National Parks and Wildlife Service (2002) Plains-wanderer (*Pedionomus torquatus*) Draft Recovery Plan. NSW National Parks and Wildlife Service, Hurstville, NSW.  
Roberts I and Roberts J (2001) Plains-wanderer (*Pedionomus torquatus*) Habitat Mapping including Woody Vegetation and other Landscape Features, Riverina Plains, NSW. Unpublished report, NSW National Parks and Wildlife Service, Hurstville, NSW.  
Swan G, Shea G and Sadlier R (2004) *A Field Guide to Reptiles of New South Wales*. (Reed New Holland: Sydney, NSW)

Received 27 September 2007; accepted 10 November 2008



Yellow-faced Honeyeater *Lichenostomus chrysops*. Photo by Heath Maconochie. See p. 135.